THE

ONTARIO WATER RESOURCES

COMMISSION

WATER POLLUTION SURVEY

of the

TOWN OF DUNDAS

COUNTY OF WENTWORTH

1968

R E P O R T

on a

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Division of Sanitary Engineering

ONTARIO WATER RESOURCES COMMISSION

R E P O R T

INTRODUCTION

A pollution survey in the Town of Dundas was carried out by Commission staff on June 5, July 5, 6, 10 and September 7, 12, 1967.

The survey encompassed the Town of Dundas and the creeks flowing through the town; these being Spencer and Ancaster Creeks and the Desjardins Canal.

All the samples were forwarded to Commission's Laboratories where pollution indicator tests were carried out. (See Appendix I).

The Town of Dundas is situated in a valley approximately three miles north of the City of Hamilton with a population of 15,178 (Municipal Directory 1967).

The economy of the town is based on industrial and commercial use. However, in the last ten years this area has developed as a suburban centre.

The main watercourse running through the town is Spencer Creek, but it offers little in the way of recreational use due to its limiting size and rapid flow. Fishing is practiced to some degree in the creek. Ancaster and Sulphur Creeks which flow into the Desjardins Canal provide little in the way of recreational use and during periods of the year only flow

intermittently. The Desjardins Canal, which at one time was a major commerce waterway connecting the Town of Dundas to Lake Ontario, has been reduced to a shallow watercourse into which flows the effluent from the town's sewage treatment plant.

EXISTING SERVICES

(a) Sewage

Municipal

The Town of Dundas is serviced by a 1.25 mgpd activated sludge plant. Recorded wastewater volumes have averaged close to the design capacity resulting in the town obtaining the services of a consulting firm to prepare a report for plant expansion. The report is presently under review by the town.

A few private septic tank systems are still in use. All the industries in the town, with the exception of the Knight Industries plant which disposes of its waste by means of a septic tank system, are connected to the town's sanitary sewers.

(b) Water

Water for the town is supplied by the City of Hamilton.

(c) Municipal Refuse Disposal

The town's refuse disposal site is located at the east end of the town adjacent to the Desjardins Canal. The site receives the town's dry and wet garbage and for a time sludge from septic tank disposal trucks was dumped at the site. At present the town

is using a small portion of the original dump site and contemplates moving to a new site in the near future. Previous evidence of leachate from the dump gaining access to the Desjardins Canal via a pond located in the dump has been found.

PRESENTATION OF RESULTS

The results of the samples along with maps showing the sample locations can be found in Appendix II, Tables 1, 2, 3 and 4 and Appendix III respectively.

DISCUSSION OF RESULTS

(a) Spencer Creek

Of the seventeen chemical samples obtained during the investigation the presence of phenols (petroleum products) were detected at sample point numbers 30 and 31 (See Appendix II, Table 2).

Three of the bacteriological samples were found to be above this Commission's objective of 2,400 coliforms per 100 ml. These being sample point numbers 26, 28 and 36 (See Appendix I and II Table 2).

The storm sewers in the town which drain into Spencer Creek showed the presence of ABS from sample point numbers 2, 5, 6, 8, 9, 12, 13 and 21, while phenols were noted at sample location number 5. Twelve of the seventeen bacteriological samples obtained were found to contain high concentrations of coliform organisms.

(b) Sulphur and Ancaster Creeks

Of the twelve chemical samples obtained, the BOD of one sample was found to be above this Commission's objective of 4 ppm, this being sample location number 48. ABS was noted in eight of the samples, these being sample location numbers 37, 39, 40, 43 and 48, (refer to Appendix II, Table 3).

Twelve of the Fifteen bacteriological samples obtained were found to be above this Commission's objective of 2,400 coliforms/ 100 ml. These being sample location numbers 37, 39, 40, 41, 42, 43, 48, and 49.

A drainage tile, sample number 38, which enters Ancaster Creek on the Golf Links Road in the Township of Ancaster was found to be discharging domestic waste to the stream, this being evident by the presence of ABS and the high bacteriological count.

(c) Desjardins Canal

Of the three chemical samples obtained, the BOD of two samples were above this Commission's objective of 4 ppm, while all three showed the presence of ABS.

The sources of pollution to the canal can be noted at sample point numbers 44 (Town of Dundas STP outfall) and 46 (drain outlet from dump) (See Appendix II, Table 4).

GENERAL DISCUSSION

In general, from the samples obtained during this survey, it would appear that the storm sewers and the three creeks are carrying pollutant waste. This can be seen from the presence of Anionic Detergents (ABS) in the chemical samples and the

high bacteriological results from the storm sewers, Sulphur and Ancaster Creek and to some extent Spencer Creek. An inspection programme of the storm sewers should be carried out to determine where the pollutant materials are gaining access to the sewers. The low level of pollutant material in Spencer Creek can be attributed to the creeks assimilation capacities.

The presence of phenols in the creek could be from a number of sources. Although the phenols are in small concentrations, further investigations will be carried out to determine their source.

With the moving of the town's refuse disposal site this immediate source of pollution will also be removed from the Desjardins Canal. However, it should be noted that the dump could be a continuing source of pollution, via the stream running through the dump, due to seepage from the dump area.

The continued discharging of the town's sewage treatment plant effluent at its present point in the canal would appear to be undesirable due to the stagnant characteristics of the canal in this area.

From October to January in 1967, the average per cent removal for BOD and Suspended Solids for the Dundas plant was 87.8 per cent and 80.6 per cent respectively. This should be compared to an expected removal of 95 per cent for both BOD and Suspended Solids removal. However, as stated previously a report for plant expansion is presently under review by the town.

With the above in mind the outfall pipe from the town's sewage treatment plant should be extended along the canal to a point where assimilation of its discharges can be readily accomplished.

From an aesthetic point of view the canal should be filled in from its present westerly end to the point of discharge. This would also mean the sealing of the dump from the drainage course running through it, ensuring that no seepage from the dump gained access to the stream. Since the natural drainage is to the canal, the runoff from the mountain could be diverted by ditching along the base of the mountain and carrying the runoff by means of a sealed pipe along the east end of the dump to the canal.

The town at present does not have an Industrial Waste By-law to enable it to control the flow of harmful material from industries to the sewer system. However, from conversations with the town engineer this is being actively considered.

RECOMMENDATIONS

It is recommended that:

1. A sewer inspection programme be initiated as per report to locate and remove sanitary wastes from the storm drainage system.

2. The source of oil pollution in Spencer Creek be determined and eliminated.

3. An Industrial Waste By-law be instituted.

4. The dump be sealed to prevent leachate gaining access to the drainage ditch located in the dump.

5. The outfall pipe from the existing sewage treatment plant should be extended along the canal route to discharge at a less critical location and the section of the Desjardins Canal from its present westerly end to the point of discharge be filled in.

6. The expansion of the town's sewage treatment facilities should continue.

Prepared by: _____

W. B. Pett, Technician,
Division of Sanitary Engineering.

WBP/fl

APPENDIX
I

APPENDIX I

EXPLANATION AND SIGNIFICANCE OF LABORATORY ANALYSES

A. Bacteriological Examination

Bacteriological examinations were performed on samples from the watercourse. The Membrane Filter technique was used to obtain a direct enumeration of coliform organisms. These organisms are normal inhabitants of the intestines of man and other warm blooded animals. They are always present in sewage and are generally minimal in other pollutants. The results of the examinations are reported as M.F. Coliform count per 100 ml.

The MPN index reported by Regional Health Laboratories on water as the Most Probable Number (MPN) per 100 millilitres of sample is employed to determine the count of coliform bacteria present in water supplies.

The Commission's objective for surface waters in Ontario is a coliform count of not greater than 2,400 organisms per 100 ml.

B. Chemical Analysis

The chemical analysis performed on stream and outfall samples included determinations for biochemical oxygen demand and suspended solids.

(1) Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts

per million (ppm) and is an indication of the amount of oxygen required for stabilization of decomposable organic matter present in sewage, polluted waters or industrial wastes. The completion of the test requires 5 days, under the controlled incubation temperature of 20°C.

The Commission's water quality objectives are (i) for stream water - a 5-day BOD of not greater than 4 ppm. (ii) for storm sewer, water pollution control plant and industrial waste discharges - a 5-day BOD of not greater than 15 ppm.

(2) Solids

The laboratory does tests to determine the total and suspended solids in a sample. The value for dissolved solids is determined by taking the mathematical difference between the total and suspended solids.

The concentration of suspended solids expressed in parts per million (PPM) is generally the most significant of the solids analyses in regard to stream water and outfall discharge qualities.

The OWRC's objective for discharge is a suspended solids concentration of not greater than 15 ppm.

ABS (ALKYL BENZENE SULFONATE)

The alkyl benzene sulfonate portion of the anionic detergents is reported in ppm. The test is generally employed to indicate the presence of illegal discharge to wastewater to storm drains.

APPENDIX

II

SEWAGE ANALYSIS

TABLE I

Date Sampled	Sample Location No.	5-Day BOD	Suspended Solids	Anionic Detergents as ABS	Phenols in ppb	Coliform/100 ml (Membrane Filter)
June 16/67	2	1.3	1	0.1	0	176
Sept. 7/67	2	0.5	7	0.03		280,000
June 16/67	5	3.8	174	0.2	6	890,000
June 16/67	6	1.1	1	0.0	0	20,000
Sept. 7/67	6	1.6	13	0.05		33,000
June 16/67	8	2.4	10	**	0	22,000
Sept. 7/67	8	1.2	29	0.05		21,000
June 16/67	9	1.4	6	0.0	0	8,400
Sept. 7/67	9	3.2	22	0.12		4,500
June 16/67	12	1.2	1	0.0	0	2,100
Sept. 7/67	12	0.6	5	0.03		210,000
June 16/67	13	1.9	1	0.0	0	8,300
Sept. 7/67	13	1.4	10	0.01		1,900
June 16/67	15	1.8	7	0.0	0	2,600
June 16/67	16					25,000
June 16/67	21	2.8	5	0.0	0	560
Sept. 7/67	21	4.4	232	0.08		388

SEWAGE ANALYSIS

TABLE 2

Date Sampled	Sample Location No.	5-Day BOD	Suspended Solids	Anionic Detergents as ABS	Phenols in ppb	Coliform/100 ml (Membrane Filter)
June 5/67	24	0.35	5	0.0	---	
July 5/67	24					320
June 5/67	25	0.4	6	0.0	---	
July 5/67	25					660
Sept.7/67	25	1.6	6			424
June 5/67	26	0.25	15	0.0	---	
July 5/67	26					670
Sept.7/67	26	1.1	7			2,600
June 5/67	27	0.5	9	0.0	---	
July 5/67	27					520
Sept.7/67	27	1.6	5			228
June 5/67	28	0.55	15	0.0	---	
July 5/67	28					18,000
Sept.7/67	28	1.0	7			340
June 5/67	29	0.5	15	0.0	---	
July 5/67	29					600
June 5/67	30	0.5	16	---	4	
July 5/67	30					810
June 5/67	31	0.4	17	---	4	
July 5/67	31					730
June 5/67	32	0.25	16	0.0		
July 5/67	32					610
June 5/67	33	0.4	16	0.0		
July 5/67	33					420
June 5/67	34	0.4	16	0.0		
June 5/67	35	0.45	16	0.0		
July 5/67	35					600
June 5/67	36	1.0	19	0.0		9,000

SEWAGE ANALYSIS

TABLE 3

Date Sampled	Sample Location No.	5-Day BOD	Suspended Solids	Anionic Detergents as ABS	Coliform/100 ml (Membrane Filter)
Sept. 12/67	36				640
July 10/67	37	3.8	36	0.1	240,000
Sept. 7/67	37	2.2	31	0.03	7,000
July 10/67	38	6.4	20	0.9	2,200,000
Sept. 7/67	38	0.5	3	0.06	180,000
July 10/67	39	3.1	42	0.1	880,000
Sept. 7/67	39	2.2	27	0.01	12,000
July 10/67	40	3.4	63	0.1	33,000
Sept. 7/67	40	1.5	35	0.01	45,000
July 10/67	41	2.4	38	0.0	67,000
July 10/67	42	2.4	22	0.0	23,000
Sept. 7/67	42	1.0	5	0.0	4,500
July 10/67	43	2.2	30	0.0	24,000
Sept. 7/67	43	0.9	9	0.02	920
July 10/67	48	4.4	82	0.1	6,900
Sept. 12/67	48				490
Sept. 12/67	49				7,000

SEWAGE ANALYSIS

DESJARDIN CANAL

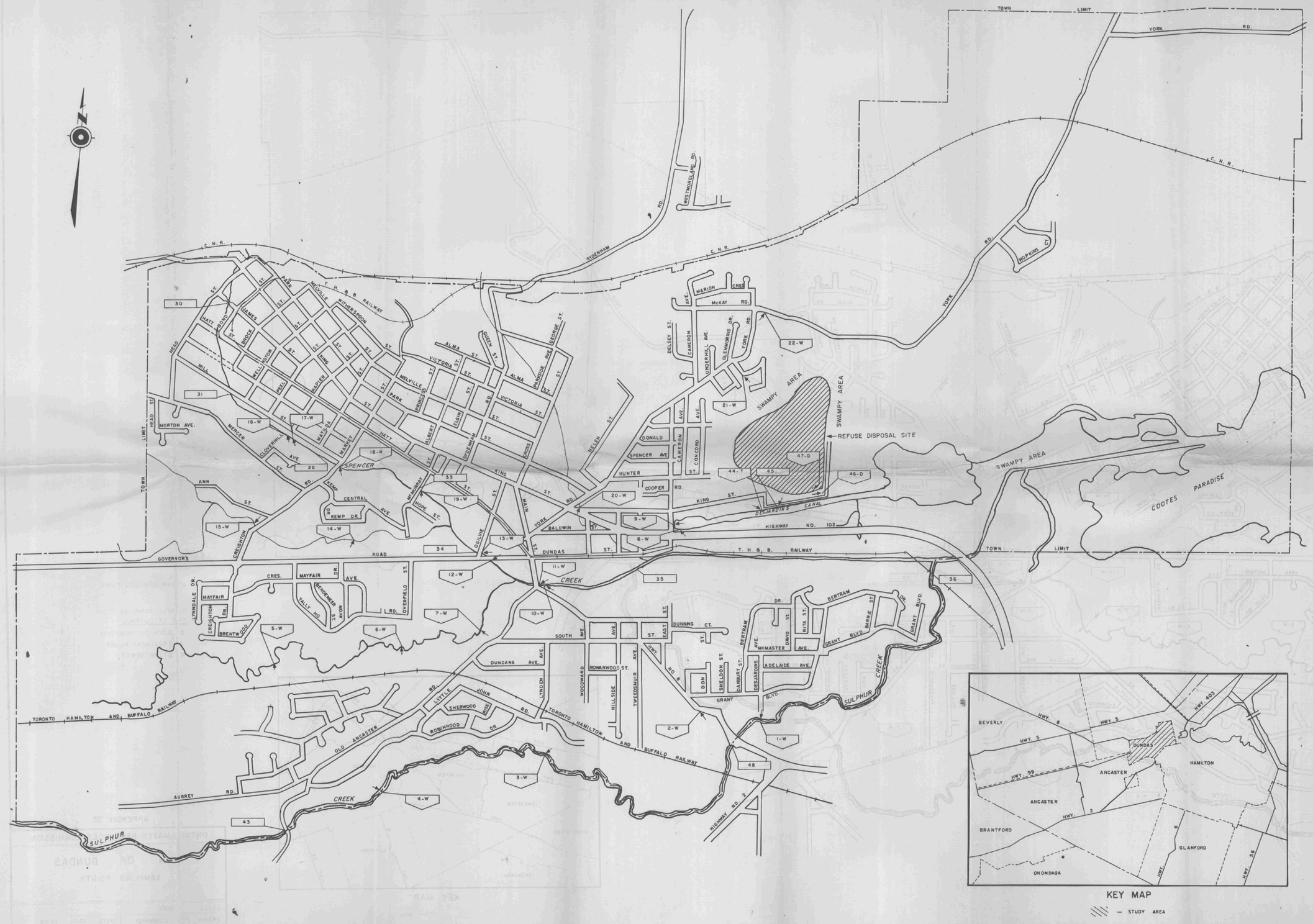
TABLE No. 4

	Date Sampled	Sample Location No.	5-Day BOD	Suspended Solids	Anionic Detergents as ABS
	Sept. 29/67	36	0.4	220	0.0
*	June 5/67	44	2.4	24	1.7
	Sept. 29/67	45	62.0	406	2.2
	Sept. 29/67	46	16.0	700	0.7
	Sept. 29/67	47	3.2	22	1.6

*NOTE: 1967 Average BOD and Suspended Solids from nine sewage plant effluent samples was 15.0 and 18.0 ppm respectively.

APPENDIX
III

DUNDAS



KEY MAP

/// — STUDY AREA

LEGEND

36 — STREAM SAMPLING POINT

13-W — OUTFALL SAMPLING POINT
— TYPE OF OUTFALL
D — DITCH OR TRIBUTARY
T — TREATMENT PLANT
W — STORM SEWER

APPENDIX III

ONTARIO WATER RESOURCES COMMISSION

TOWN OF DUNDAS
SAMPLING POINTS

SCALE: 1" = 800'	
DRAWN BY: A. LOMBARDI	DATE: APRIL 1968
CHECKED BY:	DRAWING No. 68 - 40

WELLINGTON CO.

PUSLINCH TWP.

WENTWORTH CO.

WENTWORTH CO.

WEST FLAMBOROUGH TWP.

BEVERLY TWP.

ANCASTER TWP.

WENTWORTH CO.

CRIEFF

RYS.

CAN. PAC.

VALENS

SPENCER CREEK

WESTOVER

HAYESLAND

ROCK CHAPEL

WEST SPENCER CREEK

PETERS CORNERS

GREENSVILLE

CHRISTIES CORNER

CAN. NAT. RYS.

DUNDAS

TOWN LIMIT

DESJARDINS CANAL

COOTES PARADISE

HAMILTON HARBOUR

CITY OF HAMILTON

ANCASTER CR.

SULPHUR CREEK

ANCASTER

23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48

LEGEND

30 STREAM SAMPLING POINT

– SWAMP

APPENDIX III

ONTARIO WATER RESOURCES COMMISSION

DUNDAS AREA WATERSHEDS

SAMPLING POINTS

SCALE: 1 : 50,000

DRAWN BY: R. SHISHKOFF | DATE: MAY 1968

CHECKED BY: | DRAWING Nº: 68-50